NASA Procedural Requirements

COMPLIANCE IS MANDATORY

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Subject: NASA Procedural Requirements for Limiting Orbital Debris (w/ Change 1 - 5/14/09)

Responsible Office: Office of Safety and Mission Assurance

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Chapter 1. General Information

1.1 Objectives of Limiting Orbital Debris

1.1.1 The objective of the NASA Orbital Debris Program is to limit the generation of debris in Earth orbit. Debris can damage spacecraft, provide a source for false scientific readings, and become a hazard to people and property on the ground. The United Nations, the Inter-Agency Space Debris Coordination Committee (IADC), and the International Organization for Standardization (ISO) have repeatedly asserted that all spacefaring nations should endeavor to limit the generation of debris in orbit.

1.1.2 In addition to limiting generation of debris in all Earth orbits, NASA also desires to limit the generation of debris in other space locations where future spacecraft may travel. All missions leaving Earth orbit must comply with NASA's Planetary Protection policy and requirements as described in NPD 8020.7 and NPR 8020.12. In the event of conflicts between this document and Planetary Protection requirements, the Planetary Protection requirements will take precedence.

1.1.3 Compliance with this NPR meets the guidelines and intent of the following documents (as of the date of this NPR): the U.S. Government Orbital Debris Mitigation Standard Practices and the IADC-0201, Space Debris Mitigation Guidelines.

1.1.4 This NPR requires each program and project to conduct formal assessments and plans for the disposition of spacecraft anticipated to reach the orbit or the surface of the Moon.

1.2 Description of Orbital Debris

1.2.1 Orbital debris is defined as any object placed in space (see P.2.2) by humans that remains in orbit and no longer serves any useful function or purpose. Objects range from spacecraft to spent launch vehicle stages to components and also include materials, trash, refuse, fragments, or other objects which are overtly or inadvertently cast off or generated.

1.2.2 Reusable vehicles are not considered as orbital debris in this NPR.

1.3 Roles and Responsibilities

1.3.1 Chief, Safety and Mission Assurance, Office of Safety and Mission Assurance (Chief/OSMA)

1.3.1.1 The Chief/OSMA shall lead the NASA Orbital Debris Program (Requirement 56733).

1.3.1.2 The Chief/OSMA shall establish requirements for limiting NASA's orbital debris generation from spacecraft, payloads, and launch vehicle components (Requirement 56734).

1.3.1.3 The Chief/OSMA shall establish policies for the safe disposal of NASA's spacecraft, payloads, and launch vehicle components during all phases of space missions (Requirement 56735).

1.3.1.4 The Chief/OSMA shall provide requirements and assessment procedures for orbital debris generation potential and associated risks (Requirement 56736).

1.3.1.5 The Chief/OSMA shall provide, or make available, software tools, models, and their associated data bases to aid programs in orbital debris risk analysis and evaluation of mitigation options (Requirement 56737).

1.3.1.6 The Chief/OSMA shall review all ODARs and all EOMPs (as defined in Chapter 2) to determine compliance with requirements and to review the level of associated risk (Requirement 56738).

1.3.1.7 The Chief/OSMA shall promote the adoption and use of international orbital debris mitigation guidelines through international forums, such as the IADC and the ISO (Requirement 56739).

1.3.2 Program's Mission Directorate Associate Administrator (MDAA)

1.3.2.1 The MDAA shall be the NASA official accepting the orbital debris risk as determined by the SMA Technical Authority due to noncompliances to this NPR and NSS 1740.14 or NASA-STD 8719.14 as documented in the ODAR and EOMP (Requirement 56741).

1.3.2.2 The MDAA shall ensure that a mission orbital debris assessment has been conducted in accordance with NSS 1740.14 or NASA-STD 8719.14, as applicable per paragraph P.2.4, to determine the potential for orbital debris generation from the launch vehicle and the payload (Requirement 57296).

1.3.2.3 The MDAA shall ensure that orbital debris mitigation measures identified in the ODAR are implemented and included in the EOMP (Requirement 56743).

1.3.2.4 The MDAA shall ensure that a formal review of the potential to generate orbital

debris is conducted before implementing the EOMP (Requirement 56744).

1.3.2.5 The program's MDAA shall provide to the Chief/OSMA, for Chief/OSMA concurrence, a phase-in plan and schedule for either development of new EOMPs, modification of existing EOMPs, or grandfathering of existing EOMPs within four months of the approval of this NPR (Requirement 56745).

1.3.2.6 The MDAA shall ensure that the orbital debris requirements of this NPR are included as an integral part of their program/project, to include proposals and Announcements of Opportunity for future missions (Requirement 56746).

1.3.3 Associate Administrator, Space Operations Mission Directorate (AA/SOMD)

1.3.3.1 The AA/SOMD shall review ODARs and EOMPs, in conjunction with the responsible MDAA(s), that are associated with missions that could pose a risk to humans in space (Requirement 56748).

1.3.4 Associate Administrator, Exploration Systems Mission Directorate (AA/ESMD)

1.3.4.1 The AA/ESMD shall review ODARs and EOMPs, in conjunction with the responsible MDAA(s), to determine if each ESMD-procured/controlled launch vehicle is in compliance with Agency orbital debris policy and standards (Requirement 56750).

1.3.4.2 The AA/ESMD shall incorporate the requirements of this NPR and NSS 1740.14 or NASA-STD 8719.14, as applicable per paragraph P.2.4, into the development of new launch and space transportation vehicles (Requirement 57297).

1.3.5 Assistant Administrator, Office of External Relations (AA/OER)

1.3.5.1 The AA/OER shall endeavor to incorporate the NASA debris mitigation defined in this NPR and NSS 1740.14 or NASA-STD 8719.14, as applicable per paragraph P.2.4, in negotiated international agreements for space activities and launch services (Requirement 57298).

1.3.5.2 To augment existing national procedures where the U.S. Department of Defense alerts Government agencies to the impending reentry of NASA-related space objects (See section P.2.2), the AA/OER shall, in consultation with the program's MDAA, Chief/OSMA, Office of Public Affairs, and the Office of the General Counsel, coordinate amplifying information with other U.S. Government agencies (Requirement 56754).

1.3.5.3 The AA/OER shall coordinate all NASA pre-reentry press releases for reentries with the Office of the General Counsel, the National Security Council, and the Office of Science and Technology Policy (Requirement 56755).

1.3.5.4 The AA/OER shall review and provide comments on ODARs and EOMPs as required in paragraphs 2.2.1.5 and 2.2.2.6 (Requirement 56756).

1.3.6 Assistant Administrator, Office of Public Affairs

1.3.6.1 The Office of Public Affairs shall coordinate all NASA pre-reentry press releases with the United States Strategic Command (USSTRATCOM) (via Department of Defense Public Affairs), the Chief/OSMA, the NASA AA/OER, the Office of the General Counsel, and the U.S. Department of Homeland Security, as needed (Requirement 56758).

1.3.7 NASA Office of the General Counsel

1.3.7.1 The NASA Office of the General Counsel shall review and provide comments on ODARs and EOMPs as required in paragraph 2.2.1.5 and 2.2.2.6 (Requirement 56760).

1.3.7.2 The NASA Office of the General Counsel shall consider conducting a liability assessment upon learning of an impending Earth impact into a populated area (Requirement 56761).

1.3.7.3 The NASA Office of the General Counsel shall review pre-entry press releases as required in 1.3.5.3 and 1.3.6.1 (Requirement 56762)..

1.3.8 NASA Headquarters Environmental Management Division

1.3.8.1 The NASA Headquarters Environmental Management Division shall review and provide comments on ODARs and EOMPs as required in paragraphs 2.2.1.5 and 2.2.2.6 (Requirement 56763).

1.3.9 John F. Kennedy Space Center Launch Services Program Manager (KSC/LSPM)

1.3.9.1 The KSC/LSPM shall incorporate program orbital debris requirements in launch service and launch operations planning activities and contracts unless a request for relief to the requirements has been granted per NPR 8715.3, paragraph 1.13 (Requirement 56765).

1.3.9.2 The KSC/LSPM shall provide debris assessment information for launch vehicles (and associated payload adapters) to the NASA spacecraft Program/Project Manager for integration into the mission ODAR (Requirement 56766).

1.3.10 NASA Center SMA Directors

1.3.10.1 NASA Center SMA Directors shall ensure spacecraft and launch vehicle program/project personnel incorporate applicable NASA orbital debris policies and requirements into their programs/projects (Requirement 56769).

1.3.10.2 NASA Center SMA Directors shall provide assistance to the program/project by reviewing and providing comments to ODARs and EOMPs to assist in determining compliance with this NPR and NSS 1740.14 or NASA-STD 8719.14, as applicable per paragraph P.2.4, (Requirement 57299).

1.3.10.3 NASA Center SMA Directors shall ensure that orbital debris requirements are reviewed at each major Program/Project review such as the spacecraft or mission PDR, the Critical Design Review (CDR), and other Key Decision Points (KDP) as defined in NPR 7120.5 (Requirement 56771).

1.3.10.4 For launches under NASA management occurring outside of KSC/LSPM control, the NASA manager for the launch shall perform the requirements in paragraphs 1.3.9.1 and 1.3.9.2 (Requirement 56767).

1.3.11 NASA Orbital Debris Program Office (NASA ODPO)

1.3.11.1 The NASA ODPO shall maintain a list of predicted reentry dates for NASA spacecraft and their associated orbital stages and notify the OSMA at least 60 days prior to their reentry (Requirement 56773).

1.3.11.2 The NASA ODPO shall develop, maintain, and update the orbital debris environment models to support this NPR (Requirement 56774).

1.3.11.3 The NASA ODPO shall assist NASA mission program/project managers in

technical orbital debris assessments by providing information and/or directing queries to the knowledgeable technical staff (Requirement 56775).

1.3.11.4 The NASA ODPO shall provide assistance to the Department of Defense and other U.S. Government departments and organizations on matters related to the characterization of the orbital debris environment and the application of orbital debris mitigation measures and policies for NASA space missions (Requirement 56776).

1.3.11.5 The NASA ODPO shall participate in the determination, adoption, and use of international orbital debris mitigation guidelines through international forums such as the United Nations Committee on the Peaceful Uses of Outer Space, the IADC, and the ISO (Requirement 56777).

1.3.12 SMA Technical Authority

1.3.12.1 The SMA Technical Authority shall determine the risk associated with any noncompliances to this NPR as documented in the ODAR (Requirement 56779).

1.3.12.2 The SMA Technical Authority shall provide a written determination of the risk associated with any noncompliances to this NPR as contained in the ODAR to the Program MDAA prior to launch and within 30 days of receipt (Requirement 56780).

1.3.12.3 The SMA Technical Authority shall determine the risk associated with any noncompliances to this NPR as documented in the EOMP (Requirement 56781).

1.3.12.4 The SMA Technical Authority shall provide a written determination of the risk associated with any noncompliances to this NPR as contained in the EOMP to the Program MDAA prior to implementation of the EOMP and within 30 days of receipt (Requirement 56782).

1.3.12.5 The SMA Technical Authority shall use the techniques and methods required in NPR 8000.4, Risk Management Procedural Requirements, and NPR 8705.5, Probabilistic Risk Assessment (PRA) Procedures for NASA Programs and Projects, for providing risk assessments (Requirement 56783).

1.3.12.6 The SMA Technical Authority shall establish and implement a mechanism for soliciting, receiving, and dispositioning comments and resolving issues prior to the formal issuance of NASA-STD 8719.14 and any of its revisions (or the creation of any successor documents), such that proposed changes are appropriately staffed through and issues resolved with all affected Programs at NASA Headquarters and Centers (Requirement 56784).

1.3.13 NASA Program/Project Manager

1.3.13.1 The NASA Program/Project Manager shall establish an orbital debris mitigation activity as a part of every spaceflight program/project as defined by paragraph P.2.2 (Requirement 56786).

1.3.13.2 The NASA Program/Project Manager shall provide copies of any plans describing generation of orbital debris to the SMA Technical Authority for review (Requirement 56787).

1.3.14 NASA Planetary Protection Officer (NASA PPO)

Note: See NPR 8020.12, Planetary Protection Provisions for Robotic Extraterrestrial Missions, for NASA policy and requirements for the role of

the NASA PPO.

1.3.14.1 The NASA PPO shall review and concur in the final ODAR and EOMP for disposition of spacecraft on a solar system body other than the Earth (Requirement 56790).

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